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OHIO POTATO CULTIVAR TRIALS, 1976

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Table of Contents

Introduction - 1
Statewide Trial - 1
Marietta Early Market Trial - - - - - - - - - - - - - - - 14
Celeryville Muck Trial - - - - - - - - - - - - - - - - - - 18
North Central Trial - - - - - - - - - - - - - - - - - - - 22
Streetsboro Trial - 25

The 1976 Ohio Potato Cultivar Trials were jointly sponsored by the Ohio Agricultural Research and Development Center, the Ohio Cooperative Extension Service, the Ohio Potato Growers Association and the following growers:

	Location*
Don & Ed Becker - - - - - - - - - - - - Beach City	1
Celeryville Muck Crops Branch - - - - - Celeryville	9
Chase Farms - - - - - - - - - - - - - - - Defiance	5
Frank Goodell & Sons - - - - - - - - - - Mantua	3
Louis Huck - - - - - - - - - - - - - - - Marietta	7
Galen Moomaw - - - - - - - - - - - - - - Smithville	4
Harold Thompson - - - - - - - - - - - - - Hanoverton	2
Ernst & Perry Tritten - - - - - - - - - - Lisbon	6
R. E. Weingart & Sons - - - - - - - - - - Streetsboro	8
O A R D C - - - - - - - - - - - - - - - - Wooster	10

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* see map, back cover.

OHIO POTATO CULTIVAR TRIALS, 1976

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INTRODUCTION

Potato varieties and advanced selections were tested on 8 commercial farms, the OARDC Muck Crops Branch at Celeryville, and the OARDC main campus, Wooster. The trials were divided into 5 categories in 1976 to include: 1) an across-the-state trial of eight entries on 6 commercial farms with 26 observational entries on 2 farms; 2) an early harvest trial of 12 varieties at Marietta; 3) an evaluation of 10 entries on muck at Celeryville; 4) the North Central Regional Trial involving 20 entries at Wooster; and 5) an evaluation of 27 varieties for total yield and resistance to ozone injury at Streetsboro.

STATEWIDE TRIAL

Procedure

The following 8 varieties were evaluated on 6 commercial farms across Ohio (see map, back cover).

6CX6	Katahdin
W 718	Norchip
Centennial	Snowchip
Kennebec	Superior

These and 26 observational varieties tested at locations 2 and 6 are described in Table 1. Superior was included for comparison with other early-maturing varieties while Katahdin served that purpose for late-season entries. Norchip was used as a chipping standard.

Plots were located in commercial fields to insure the use of commercially-accepted cultural and pest control measures (Table 2). Soil type and fertility varied widely from farm to farm. With the exception of boron, all elements were in the acceptable range. Boron was slightly low on farms 1 and 2 (Table 3). Planting dates ranged from April 14 to May 12, harvest dates from September 10 to October 30.

Major plots were double rows of 50 seedpieces each and were replicated a minimum of 3 times at each location. Observational entries were grown in plots half the size of the major plots and consisted of 50 seedpieces divided into 2 rows of 25 each. Observational entries were replicated only 2 times at each of the 2 locations.

Stand, vigor and disease were rated during the season. At harvest, tubers were dug by machine, left in the field to dry for 30 minutes and then weighed. A 50-lb. sample from each plot was then graded and a sub-sample of 15 lbs. was taken for chipping tests in the Horticulture Pilot Plant at OSU. Results of chip and storage tests will be reported separately.

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TABLE 1. Origin and Characteristics of Entries, STATEWIDE TRIAL, 1976

Entry	Locations Tested	Origin	Years in Ohio Tests	Resistance	Comments
			MAJOR ENTRIES		
6CX6	All	Pa.	5	Susc. to drought	High sp.gr. Sl. russ. Good yields but var. size, shape.
W 718	All	Wisc.	4	Susc. Hollow heart	Large, smooth tubers. High yields. Midseason.
Centennial Russet	All	Wash. Colo., 1975	1	Susc. Ozone Damage	Long russet. Smooth but small tubers. Low yields.
Katahdin	All	USDA, 1935	14	Res't. leaf roll, mosaic, net necrosis	Standard midseason variety in Ohio. Smooth tubers.
Kennebec	All	USDA, 1948	10	Susc. viruses, Vert. wilt, L. blight	Good chipping, table stock variety in Ohio. Better chipper than Katahdin.
Norchip	All	N.D., 1968	10	Res't. scab. Susc. Vert., PVX, spindle tuber.	Standard chipping variety. Sets heavily, small tubers. Rgh., greens. Average yields.
Snowchip	All	Alaska & USDA, 1973	3	Undetermined	High yields, sp. gravity. Deep eyes. Chips. Large tubers.
Superior	All	Wisc., 1961	14	Res't. to scab, late blight, ozone damage. Susc. "early dying".	Standard early all-purpose variety.
			OBSERVATIONAL ENTRIES		
Alma(F61025)	2,6	N.B., 1975	3	----	Midseason. Avg. yields. Pink eyes. Deep bud end. Chips, All purpose.

TABLE 1. Origin and Characteristics of Entries, STATEWIDE TRIAL, 1976 (cont.)

Entry	Locations Tested	Origin	Years in Ohio Tests	Resistance	Comments
Anoka	2,6	Minn., 1964	6	Res't. scab, L. blight	Low yields. Early. Small tubers. High solids, chips.
Atlantic	2,6	USDA, 1975	2	Susc. to hollow heart	High yields, sp. grav. PROMISING.
Late Hi Plains	2,6	Late Selection of Hi Plains	1	----	Long, rough white tubers. No promise in Ohio.
Late Superior	2,6	Late Selection of Superior	1	----	Large, rough.
Norgold 10	2,6	Selection of Norgold	1	----	2nd growth. Otherwise O.K.
Norgold 35	2,6	Selection of Norgold	1	----	Tubers smaller than 10.
Wischip	2,6	Wisc., 1974	4	Tol. scab. Susc. L. blight, ozone damage	Early, chips. Low yields, small tubers.
W 623	2,6	Wisc.	4	----	Large tubers. Greening.
W 721	2,6	Wisc.	2	----	Tubers too small. Attractive.
W 710	2,6	Wisc.	4	----	Early. Attractive, good yields. Promising.
WC230-14	2,6	Colo.	1	----	Long russet. Low yields. Susc. hollow heart.
ND8891-3	2,6	N.D.	2	----	High yields, solids. Chips. Promising.
W 723	2,6	Wisc.	2	----	Above avg. yields. Grades.

TABLE 1. Origin and Characteristics of Entries, STATEWIDE TRIAL, 1976 (cont.)

Entry	Locations Tested	Origin	Years in Ohio Tests	Resistance	Comments
W 731	2,6	Wisc.	2	----	Good yields, poor grades. Growth cracks. Bad shape.
W 726	2,6	Wisc.	2	Susc. scab, rhizoctonia	Good yields, low grades. oblong shape.
MS 709	2,6	Mich.	7	----	High yields, but variable. Attractive, large tubers.
MS 711-8	2,6	Mich.	2	----	Good yields, attractive.
AK 28-8	2,6	Alaska	2	----	Above avg. yields in '76, low in '75.
Neb. 42-1	2,6	Neb.	1	----	Long, attractive russet. Low yields.
ND 8913-4 Russ.	2,6	N.D.	1	----	Oblong russ. Avg. yields. Some 2nd growth. No promise.
ND 8914-5 R.	2,6	N.D.	1	----	Long russet. Poor yields.
ND 8751-16	2,6	N.D.	1	----	Poor seed in '76. No promise.
C.A. 46-11 (1381)	2,6	Campbell Soup	1	----	Promising rd. white. Large, Smooth.
C.A. 55-24 (3386)	2,6	Campbell Soup	1	----	O.K. but not as good as 46-11. Some 2nd growth, rgh.
FL 162	2,6	Frito-Lay	1	----	Low yields, small tubers. Uniform shape.

Results

Yield.--Snowchip out-yielded all others in 1976 (Table 4). Snowchip has excellent yield potential under Ohio conditions but the tubers have been too rough due to deep eyes and excessive shouldering. Preliminary chip tests in Ohio indicate Snowchip will chip satisfactorily from the field or warm storage, but may not recondition well from cold storage.

W 718 has yielded well for several years in Ohio (Table 5). It ranked second in yield in the 1976 STATEWIDE TRIAL and first in 1975. Tubers of W 718 were attractive and somewhat large (Table 6). Large tuber size probably accounted in part for the high incidence of hollow heart in 1976. W 718 has not been noticeably susceptible to hollow heart in preceding years; the use of B-size seed and close spacing may have reduced the severity. W 718 tubers were sufficiently smooth and attractive to have considerable promise as a table stock variety in Ohio if hollow heart can be controlled. Preliminary tests have indicated W 718 is questionable for chipping.

Kennebec and Katahdin were used as midseason-to-late standards again in 1976 and yielded about as expected. Kennebec has typically outyielded Katahdin but has usually produced some 40 to 50 cwt less than the highest yielding varieties most years. Kennebec tubers have been rougher than those of Katahdin and more susceptible to storage rots.

Superior, which was used as a standard for earliness, yielded relatively well in 1976 with 342 cwt. It has ranked either last or next to last most years. Despite a history of low yields Superior is widely grown in Ohio due to its earliness and scab resistance. It has ranked as the No. 1 early variety on muck soils in Ohio for several years.

6CX6 has not been especially promising for either yield or quality in Ohio and will be dropped from further testing. Centennial Russet also yielded poorly in 1976 and appeared to have little promise despite reports of high yields and earliness from western states. Overall shape and appearance of Centennial tubers were excellent, however.

Norchip was included as a chipping standard. It has yielded poorly in Ohio tests in most years and ranked last in 1975 and second to last in 1976. Norchip has been susceptible to greening, rough tuber shape and deep eyes. It is grown extensively in Ohio despite these deficiencies because of its excellent chipping quality. Norchip normally has not stored well beyond late January or early February.

Grade.--Highest grades were produced by Superior with 90.3 percent U.S No. 1 and lowest by Kennebec with 78 percent No. 1's (Table 6). These trends were consistent with previous years. Kennebec marketability has usually been low due to off-shapes and greening, whereas, Superior usually has graded out well. Norchip also produced a low percent marketability due to off-shapes, greening and undersized tubers. The low percent marketability for Centennial was accounted for primarily by undersized tubers since shape and appearance were excellent for this variety. The high grade-out for Snowchip was somewhat surprising in view of the deep eyes and tendency toward shouldering; Snowchip tubers were uniform in appearance, however, with a minimum of second growth and greening.

Average tuber weight ranged from 0.31 lbs for Centennial to 0.47 for W 718, Kennebec, and Katahdin. Average across all locations was 0.41 lb. in both 1975 and 1976. Both Norchip and Superior, have typically produced small tubers in Ohio tests.

TABLE 2. Cultural and Pest Control Methods, STATEWIDE TRIAL, 1976

	LOCATION NUMBER					
	1	2	3	4	5	6
Planted	April 14	April 20	April 29	April 30	May 10	May 12
Killed	August 12	September 11	September 6	N/A	October 3	September 14
Harvested	September 10	September 30	September 29	October 30	October 4	October 7
Days to Kill	120	144	130	Mature	148	118
Days to Harvest	149	163	153	183	147	141
1975 Crop	Sweet Corn	Wheat	Wheat	Wheat	Wheat	Wheat
Cover Crop	Rye	Clover & Timothy	Brome Grass	Clover	Rye	Clover & Timothy
Fertilizer, Lb/A						
Broadcast	150 urea + 250 6-24-24	----	----	----	120 K + 200 N	----
In-Row	500 12-24-24	1000 10-20-20	1000 16-16-16	1100 15-15-15	600 14-14-14	1000 10-20-20
Herbicide, Per acre	Eptam, 4 1/2 lb.	Eptam + Lorox Pre-emerge	Lorox + Lasso	Lorox	Lasso, 1/2 lb. + Lorox, 3/4 lb.	Eptam
Syst. Insect, Per acre	Di-Syston, 20 lb.	Temik	Temik, 20 Lb.	Temik, 17 lb.	----	Di-Syston
Spacing, In.	9.5 x 36	8.5 x 36	8 x 32	10 x 34	10.5 x 36	11 x 34
Soil Type	Sandy Silt Loam	Silt Loam	Chile Silt Loam	Silt Loam	Sandy Loam	Wooster Silt Loam
Moisture, In*	23.2	20.9	15.6	22.9	11.6	22.0

* Total moisture planting to harvest for locations 1, 2, 5 and 6; planting to vine kill for locations 3 and 4. Farm No. 1 received 3-in. of irrigation in June.

TABLE 3. Soil Test Data, Ohio Potato Variety Trials, 1976

Location	pH	LTI[1]	Pounds Per Acre P	K	Ca	Mg	NO	Mn	Zn	B	% Base Saturation % Ca	% Mg	%K	CEC[2]	OM[3]
1	5.9	64	171	501	4370	460	20	75	40	0.8	48	10	3.8	20	3.9
2	5.9	67	170	566	2390	507	66	64	27	0.7	48	17	5.8	12	2.4
3	6.5	68	147	286	2540	367	12	65	14	1.1	59	14	3.4	10	2.6
4	5.0	61	169	439	1530	287	22	78	20	1.1	23	7	3.4	16	2.1
5	5.3	64	154	333	2855	242	28	33	14	1.0	46	6	2.9	14	3.3
6	5.2	62	157	296	2360	126	10	66	13	3.9	36	3	2.3	16	2.6

(1) LTI = Lime Test Index
(2) CEC = Cation Exchange Capacity
(3) OM = Percent Organic Matter

TABLE 4. U.S. No. 1 Yields in Cwt. per Acre, Major Entries, STATEWIDE TRIAL, 1976

Entry[1]	LOCATION 1	2	3	4	5	6	Average
Snowchip	565	333	249	523	331	414	402
W 718	468	400	255	526	308	251	385
Kennebec	428	258	330	460	262	314	343
Superior	396	196	242	408	238	360	342
Katahdin	379	367	213	444	310	345	319
6CX6	363	319	278	380	263	309	307
Norchip	296	196	212	366	290	280	273
Centennial	130	165	65	195	202	179	156
Average	378	280	231	427	276	319	316
LSD .05[2]							

(1) Entries ranked according to average yields across all locations.
(2) LSD .05: Locations = 34.8, Varieties = 40.2.

TABLE 5. U.S. No. 1 Yields in Cwt./A for Major Entries Tested in the STATEWIDE TRIAL in 1976 Or More Than 1 Year in the Last 10 Years.

	YEAR									
Variety	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
EARLY										
Haig	254	233	----	----	310	296	----	----	----	----
Alamo	----	298	286	308	277	----	----	----	----	----
Superior	283	269	308	269	275	228	287	266	273	342
Centennial	----	----	----	----	----	----	----	----	----	156
MEDIUM EARLY										
La Chipper	325	272	301	----	----	----	----	----	----	----
Platte	315	273	302	----	----	----	----	----	----	----
Monona	288	231	284	274	300	----	----	----	----	----
Abnaki	----	----	----	----	319	297	291	260	----	----
MIDSEASON										
Peconic	----	305	297	349	290	----	----	----	----	----
Shurchip	----	----	385	282	335	304	310	305	327	----
Norchip	----	307	282	355	294	284	292	297	272	273
Hudson	----	----	----	----	347	352	342	396	348	----
Katahdin	327	284	290	344	285	277	283	301	336	319
Kennebec	285	----	----	----	----	285	280	362	321	343
Lenape	326	263	274	----	----	----	----	----	----	----
W 710	----	----	----	----	----	----	----	----	315	----
W 718	----	----	----	----	----	----	----	----	371	385
6CX6	----	----	----	----	----	----	----	----	307	307
Penn 71	----	----	----	----	----	----	268	293	----	----
Snowchip	----	----	----	----	----	----	----	----	----	402
LATE										
Ona	350	319	----	----	----	----	----	----	----	----
Average	305	280	312	311	300	290	294	310	319	316

Hollow heart was prevalent in 1976. Random sampling of jumbo-sized tubers at a number of locations showed the following trends: W 718, 55% hollow; Superior, 36%; Kennebec, 27%; Katahdin, 24%; Norchip and 6CX6, 20%; Snowchip, 10%; and Centennial, 6% hollow. Of all the varieties, hollow heart was most serious with W 718 and may limit the usefulness of this selection in Ohio.

Stand and vigor.--Average stands were good in 1976 ranging from 84% for Centennial to 95% for Kennebec. Centennial plants emerged unevenly and were not vigorous during the season. W 718 and Katahdin were also slow to emerge; Katahdin is typically slow. W 718 produced second highest yields in 1976 but second lowest stands. W 718 has consistently yielded well most years despite characteristically low stands. Centennial plants died early due to a combination of poor natural vigor and severe susceptibility to ozone damage at most locations. The vigor of other cultivars was acceptable.

Stands were poorest on farm No. 3 in 1976 and were relatively low at this location in 1975. Reasons for this are not clear, but stem injury was probably involved since Rhizoctonia has been troublesome on Farm No. 3.

Observational Varieties

Several observational varieties showed promise in 1976. Atlantic led in yield among this group with 383 cwt. per acre of U.S. No. 1 potatoes (Table 7). Atlantic tubers were typically slightly rough and more susceptible to hollow heart than standard Ohio varieties; however, tubers were also uniform in appearance and graded 90% No. 1's. Due to high yield potential, tuber uniformity and high specific gravity, Atlantic will be evaluated more thoroughly in 1977.

W 710 yielded well at Marietta during the last 2 years and ranked 2nd in yield after Atlantic among the 1976 observational selections. It matured early, produced smooth, attractive tubers and had a tough skin early. Based on 1976 data, W 710 may well compete with Superior as an early fresh market variety. Gravity has been somewhat low for chipping. Other Wisconsin lines worth further consideration included W 721, W 723 and possibly W 623 for early market. Tubers of W 723 were smaller than those of either W 623 or W 721, but were also smoother.

ND 8891-3 may well be the most promising selection among the observational entries. It has performed consistently well across the north central states and was rated No. 1 in the North Central Regional Trials in several states in 1976. It has been consistently high in total solids and has usually chipped well both from the field and from storage. Tubers resembled those of Norchip in color but were longer and smoother. ND 8891-3 matured relatively late.

TABLE 6. Percent Stand, Tuber Grade and Average Tuber Size, Major Entries, STATEWIDE TRIAL, 1976

Variety	Percent Stand	Percent			Avg. Tuber Wt., Lbs.
		U.S. No. 1	B-Size	Culls	
Snowchip	90	89.0	3.3	7.5	0.43
W 718	87	88.5	3.1	8.1	0.47
Kennebec	95	78.0	2.3	19.6	0.47
Superior	94	90.3	3.2	6.5	0.39
Katahdin	88	89.3	2.9	7.8	0.47
6CX6	93	87.5	4.1	8.4	0.39
Norchip	92	80.3	4.5	15.1	0.36
Centennial	84	82.7	10.2	5.5	0.31
Average	90	85.7	4.2	9.8	0.41
LSD .05	3.1	3.4	1.2	3.1	N/A

TABLE 7. Percent Stand, U.S. No. 1 Yield, Grade and Characteristics of Observational Entries, STATEWIDE TRIAL, 1976

Entry[1]	Percent Stand	U.S. No. 1 Cwt/A	U.S. No. 1 %	Avg. Tuber Wt., Lb.	Comments
Atlantic	92	383	90	.48	Large tubers, Sl. rough. Tough skin. Promising. Heat necrosis?
W 710	92	382	88	.43	Very promising. Smooth, high yields.
W 721	91	356	88	.37	Tubers quite small. Shape, yields are good.
Late Superior	97	334	84	.48	Large tubers. Deep bud end. Rgh.
CA 46-11	80	330	77	.64	Very large. Smooth, good skins. Test further!
Late Hi-Plains	93	326	76	.43	Long, rough white. Discard.
MS 709	94	325	77	.51	Large tubers. Eyes mostly shallow. Promising.
MS 711-8	95	323	83	.47	Smooth. Good yields. Promising.
ND 8891-3	94	322	81	.41	Attractive, round-oblong white. Good shape, skins. High gravity.
W 723[3]	98	321	80	.41	Attractive, round white. Good size, shape.
W 726	87	321	69	.57	Smooth, tan skins.
CA 55-24	94	315	86	.54	Second growth. Good size. May be too rough.
Norgold 10	99	300	81	.44	Smooth russet.
FL 162[3]	92	287	83	.31	---------
Norgold 35	94	284	81	.46	Not as smooth as Norgold 10.
Alma (F61025)	90	274	76	.53	Red eyes. Some red skins. 2nd growth. deep buds. Discard.

TABLE 7. Percent Stand, U.S. No. 1 Yield, Grade and Characteristics of Observational Entries, STATEWIDE TRIAL, 1976 (cont.)

Entry (1)	Percent Stand	U.S. No. 1 Cwt/A	U.S. No. 1 %	Avg. Tuber Wt., Lb.	Comments
AK 28-8 (2)	92	272	81	.46	Excessive shouldering. Fair skins. Mechanical damage. Late.
Wischip	92	262	87	.33	Small tubers. Perfect shape. Low yields.
Neb. 42-1	80	257	77	.33	Oblong russet. Tubers small. 2nd growth. Discard.
Anoka	95	234	85	.40	Smooth. Low yields. Early.
W 623	92	233	78	.43	No yield. Attractive.
WC 230-14	94	227	82	.42	Low yields. Excellent shape. May be scabby.
ND 8913-4	97	224	73	.31	Dumbbells, spindles. Growth cracks. Discard.
W 731	90	220	69	.47	Growth cracks. Off shapes. Discard.
ND 8751-16	95	217	67	.33	Terrible shape. Small.
ND 8914-5	96	137	55	.43	Long russet. 2nd growth. Not as smooth as Norgold.
Average	93	285	80	.43	

(1) Entries ranked according to U.S. No. 1 yield.
(2) Farm No. 5 only.
(3) Farm No. 6 only.

MARIETTA EARLY MARKET TRIAL

Potato production in the southern half of Ohio is limited primarily to late summer cropping. Fields are planted in early April and harvested in July and early August. Marketing is geared for tablestock and crops are seldom stored more than a few days on the farm.

Twelve varieties were tested for late summer cropping at Marietta in 1976. These were, in approximate order of maturity:

Superior	Norchip
Anoka	W 718
Wischip	W 721
W 710	Katahdin
Centennial	6CX6
W 623	Kennebec

Entries are described in Table 1. Superior was included for comparison with early-maturing varieties. Although chipping is not a principal market outlet for the southern Ohio crop, all entries were compared with Norchip for chipping potential. Chip results will be reported separately.

Procedure

Plots were planted by machine on April 16 in Wheeling Gravelly Loam cropped to potatoes in 1975. Plots were double rows 50 feet long as described in the STATEWIDE TRIAL. Seedpieces were spaced 9.5 inches apart in 34-inch rows. Temik was banded at planting at the rate of 18 lbs. per acre. The soil was fertilized with 1100 lbs. per acre of 12-12-12 banded beside and below the rows at planting. Weeds were controlled by Eptam and cultivation. Total rainfall planting to harvest was 12.06 inches.

Vines were shredded and plots were harvested on August 3 for a total growing season of 109 days planting-to-harvest. Harvest and grading operations were conducted as described for the STATEWIDE TRIAL. Tubers were dug, allowed to dry in the field, weighed, and a subsample of 50 lbs. was then taken for grading; 15 lb. samples from each plot were then chipped in the Horticulture Pilot Plant at OSU. Vines of W 710, Anoka, Wischip, Centennial and Superior were declining at harvest, whereas, W 718, Norchip, Katahdin and W 721 were still moderately vigorous and W 623, 6CX6 and Kennebec were still vigorous.

Results

Yield.--W 710 produced 372 cwt. in 1976 to lead in yield as it did in 1975 (Tables 8 and 9). Tubers were smooth, shallow-eyed and attractive. Skin color was slightly darker than Katahdin and Kennebec, probably due to the fact that W 710 matured earlier; skins were well set at harvest. Superior yielded relatively well in comparison to past years with 342 cwt. Superior has produced only average or slightly above average yields in most years at Marietta. Other varieties yielding well were Anoka, 320 cwt; W 718, 292 cwt; and Wischip with 290 cwt. per acre of marketable potatoes.

Those varieties producing lower average yields than Superior are questionable for use in Ohio. Therefore, Katahdin, Kennebec, Centennial, 6CX6, Norchip and probably W 623 will not be tested further. Wischip and W 718 are also questionable. Anoka may be tested further based on 1976 data.

TABLE 8. Yield, Grade and Percent Stand, MARIETTA EARLY MARKET TRIAL, 1976

Entry	U. S. No. 1 cwt/A	U. S. No. 1 Percent	Percent B-Size[1]	Percent Culls	Percent Stand
W 710	372	80	7.2	12.8	99
Superior	342	86	6.8	7.4	96
Anoka	320	85	9.4	5.6	88
W 718	295	85	7.4	7.4	87
Wischip	290	81	14.8	3.8	95
W 623	263	79	9.2	11.8	92
Norchip	243	72	16.0	11.6	95
W 721	219	71	21.8	7.6	96
Centennial	210	79	13.0	7.8	83
Kennebec	183	69	13.8	17.4	92
Katahdin	162	73	11.6	15.0	88
6CX6	113	63	30.8	6.6	98
Average	251	77	13.5	9.6	94
LSD .05	49.9	6.6	4.7	5.4	6.7

(1) 1 7/8-inch Screen

TABLE 9. U. S. No. 1 Yields in Cwt. per Acre, MARIETTA EARLY MARKET TRIAL, 1972-1976

Cultivar	1972	1973	1974	1975	1976
W 710	----	----	----	310	372
Hudson	----	----	----	261	----
Shurchip	416	302	408	252	----
Superior	322	221	386	235	342
Kennebec	----	244	394	224	183
Onaway	365	254	----	222	----
Anoka	----	----	331	219	320
W 718	----	----	----	199	295
Penn 71	----	222	262	198	----
Norchip	----	244	348	197	243
Katahdin	262	195	332	170	162
6CX6	----	----	----	162	113
Wischip	----	----	282	161	290
Targhee	----	----	----	81	----
Nampa	----	----	----	75	----
Abnaki	336	181	409	----	----
Seminole	298	----	326	----	----
Norland	----	192	223	----	----
York	----	137	158	----	----
Red LaSoda	----	231	----	----	----
La Rouge	----	231	----	----	----
Haig (L)	305	221	----	----	----
Chippewa	238	----	----	----	----
W 721	----	----	----	----	219
Cobbler	285	----	----	----	----
W 623	----	----	----	----	263
Alamo	267	----	----	----	----
Centennial	----	----	----	----	210
Average	318	221	322	198	251

Grade.--Tuber grade-out was poorer at Marietta than in the STATEWIDE TRIAL. Only 77% of all tubers were classed U.S. No. 1 at Marietta compared to 85.7% in the STATEWIDE TRIAL. Undersized tubers accounted largely for the low marketability at Marietta. This was expected since some varieties were not mature at harvest. Some 13.5% of the total yield were B-sized at Marietta compared to only 4.2% in the STATEWIDE TRIAL. Percent culls were 9.6% at Marietta and 9.8% statewide.

Best tuber grades were produced by Superior with 86% No. 1's followed by Anoka and W 718 with 85% each. 6CX6 produced the lowest percentage marketability due primarily to 30% undersized tubers. Both Kennebec and Katahdin were subject to sungreening and a higher percentage of culls than other varieties.

Stands.--Stands were excellent at Marietta in 1976 and averaged 94% across all varieties compared to 90% for the STATEWIDE TRIAL. Centennial emerged unevenly so that final stands were slightly higher than the 83% indicated. Centennial vigor was poor throughout the season, however.

Observations.--W 710 appeared to be the most promising variety tested at Marietta in 1976 based on available data. More complete field and cooking tests are needed before W 710 can be recommended, however. Superior continues to be an acceptable but not an outstanding early market variety. Quality is good but yields tend to be too low most years. Both Anoka and W 718 may have promise and will be tested further. Wischip will not yield at Marietta most years and will be dropped, as will the later-maturing Kennebec, Katahdin and 6CX6.

CELERYVILLE MUCK CROPS TRIAL

The following ten varieties, ranked by approximate order of maturity from early to late, were tested at the OARDC Muck Crops Branch, Celeryville in 1976:

Superior	Centennial
W 710	Norchip
Wischip	W 718
NDA 8451-3	6CX6
Anoka	Katahdin

Superior is a standard early muck variety due to its exceptional scab resistance and was included for purposes of comparison with early-maturing entries. Katahdin is widely grown as a late muck potato and was included as a standard for comparison with midseason-to-late maturing varieties.

Procedure

Seed were spaced 11 inches apart by machine on May 12. Plots were double rows 25 feet long and were replicated 5 times in a randomized block design. The deep, 95% organic matter muck soil was fertilized with 800 lbs. per acre of 0-25-25 broadcast and incorporated before planting. Nitrogen was omitted. Insects were controlled by a combination of Temik banded at planting and timely foliar sprays of Sevin, Parathion and Monitor during the latter half of the growing season. Satisfactory disease control was achieved by weekly applications of Dithane M-45 beginning in mid-July. Weed control measures consisted of pre- and post-emergence applications of Sencor at 1/2 lb. active per acre and mechanical cultivation. Rainfall was supplemented by irrigation to provide a minimum of 1-inch of water per week.

Plots were harvested on September 24 approximately 2 weeks after the application of Dow General vine killer and graded on September 27. Sample tubers from each plot were chipped in the Horticulture Pilot Plant at OSU; results will be reported separately.

Results

Yield.--W 718 produced highest U.S. No. 1 yields in 1976 with 337 cwt/ acre (Table 10) but yielded relatively poorly in 1975 (Table 11). 1976 results were more typical of the yield potential of W 718 based on performance on mineral soil. All other varieties produced considerably less than W 718. Anoka, the second highest yielding variety produced only 254 cwt., while Superior and Katahdin produced almost indentical yields of 235 and 232 cwt., respectively. In past years, Superior consistently yielded either below average or slightly above average on muck while Katahdin typically yielded above average. All other entries in the 1976 trial yielded less than the 229 cwt. average. The early varieties, Centennial, Wischip and especially the long russet NDA 8451-3, yielded very poorly. Low Centennial and Wischip yields on muck were consistent with those on mineral soils in 1976 (Table 4). W 710 yielded poorly on muck in both 1975 and 1976.

Grade.--W 718 tubers graded 85% U.S. No. 1 and lead all other varieties in marketability. Tubers were large averaging 0.45 lb. each, smooth and shallow-eyed with light-colored skins. Skin feathering was noticeable at harvest but tubers were generally more mature than those of Katahdin. Hollow heart has been a problem with W718 on mineral soils. Anoka, Wischip, Centennial and Superior also produced more than 80% U.S. No. 1 potatoes. Anoka skins were subject to scab and enlarged lenticels; these factors may limit its usefulness on muck. NDA 8451-3 produced lowest grades

at 70.6% U.S. No.1. A high percentage of B-sized tubers accounted for the low NDA 8451-3 grade-out. Norchip was subject to greening, off-shapes and second growth in 1976.

Stand.--Plant stands were relatively low on muck (83.6%) compared to mineral soils (90.0%) in 1976. Low stands were accounted for in large part by a high incidence of rhizoctonia stem canker. Premature seedpiece decay was also prevalent. Varieties producing lowest stands were W 718 with 68.9% and NDA 8451-3 with 69.6% stand. W 718 produced lowest stands but highest yields in both the 1975 STATEWIDE TRIAL (Table 4) and in the 1976 MUCK CROPS TRIAL. Poor stands appeared to be normal for W 718 in 1976.

Observations.--W 718 appeared to be a promising muck variety despite poor performance in 1975 and very low stands in 1976. Tuber shape, size and color were excellent. Hollow heart was a problem with this variety in view of results on mineral soils in 1976. It may be necessary to plant W 718 closer than normal, kill the vines early, promote a better stand or reduce tuber size by some other method in order to reduce hollow heart. More tests are necessary before W 718 can be recommended commercially.

Wischip tubers are typically too small and yields are too low on muck. Tuber shape, earliness and scab resistance are good, however. W 710 appears to have little promise, yielding poorly in both 1975 and 1976 on muck. The two russets, Centennial and NDA 8451-3, likewise yielded poorly in 1976 and appear to have no promise on muck. 6CX6 will also be dropped from future trials due to low yields. Anoka and Superior will be retained for at least 1 more year.

TABLE 10. Yield, Grade, and Tuber Size, CELERYVILLE MUCK CROPS TRIAL, 1976

Entry	U.S. No. 1 cwt/A	U.S. No. 1 %	B-Size %	Culls %	Avg. Tuber Size #	% Stand	Comments
W 718	337	85.0	5.6	9.5	0.46	68.9	Smooth, Shallow eyes, Promising.
Anoka	254	83.8	7.1	9.0	0.40	83.6	Uniform shape. Some scab & lge. lenticels.
Superior	235	80.6	9.2	10.3	0.37	88.7	Rough. Deep bud end. Good Skin.
Katahdin	226	79.8	7.3	12.8	0.37	92.4	Green. Feathering.
6CX6	228	78.0	8.6	13.4	0.35	90.9	Rough. Green, feathering. Deep bud end.
Norchip	211	71.6	9.1	19.4	0.37	82.9	Rgh. Green, 2nd growth.
W 710	213	79.0	14.2	6.5	0.36	90.2	Beautiful. Thick skins. No blemishes.
Centennial	201	82.6	11.0	6.4	0.43	79.9	Attractive long russet.
Wischip	198	83.2	13.8	2.9	0.30	88.7	Very round. Smooth, Small.
NDA 8451-3	169	70.6	14.4	14.9	0.50	69.6	Rough russ. Deep eyes.
Average	229	79.4	10.0	10.5	0.39	83.6	
LSD .05	36.9	4.3	2.7	3.2	0.04	--	

TABLE 11. Average U.S. No. 1 Yields in cwt/A, CELERYVILLE TRIAL, 1971-1976

Entry	1971	1972	1973	1974	1975	1976
Shurchip	328	309	252	369	288	----
Katahdin	308	270	264	----	266	232
Hudson	----	312	150	429	264	----
W 710	----	----	----	----	234	213
Norchip	315	232	231	263	231	219
Superior	159	167	109	288	224	235
W 718	----	----	----	----	206	337
Kennebec	----	296	156	404	159	----
6CX6	----	----	----	----	151	228
Abnaki	360	302	205	----	----	----
Haig	311	290	----	----	----	----
Onaway	----	----	202	----	----	----
6RF1	----	----	201	----	----	----
Penn 71	----	----	98	348	----	----
Wischip	----	----	----	----	----	198
Centennial	----	----	----	----	----	201
NDA 8451-3	----	----	----	----	----	169
Anoka	----	----	----	----	----	254
Average	296	272	187	350	225	229

NORTH CENTRAL REGIONAL TRIAL

The North Central Regional Potato Variety Trial has been conducted for over 25 years. Since the trials began in 1951, at least 33 varieties have been named after testing in this program. Norchip, Shurchip, Wischip, Superior, Abnaki, and several others which have been grown in Ohio were introduced through the NCR trials.

Procedure

Twenty varieties and advanced selections were evaluated in a randomized block design replicated 4 times at Wooster (Table 12). Plots were single rows 25 feet long. Seed were planted 11.2 inches apart in 34-inch rows using an assisted-feed planter on May 3. The Wooster Silt Loam soil was fertilized with 600 lbs. per acre of 10-20-20 broadcast and disked in followed by 500 lbs. per acre of 10-20-20 banded at planting. The systemic insecticide Temik was also banded beside the rows @15 lbs. per acre at planting. Weeds were controlled adequately by an application of Sencor according to label directions just prior to crop emergence. Quackgrass and barnyard grass were evident late in the season, but did not appear to reduce yields.

Crop vigor was generally good during the season. Rainfall was adequate and fairly well distributed except for May which was drier than normal. Total precipitation May through September was 16.1 inches. Disease was minimal during the season due to the weekly application of Dithane M-45; however, late blight was evident in 2-3% of the tubers at harvest. The vines were sprayed with MH-30 according to label directions for sprout control and were killed by an application of Dow General on September 21. Plots were harvested on October 18 and tubers were graded on October 20. Specific gravities were determined using the potato hydrometer method.

Results

Yield.--Yields were exceptionally high averaging 341 cwt. across all varieties (Table 12). High yields were due primarily to excellent growing conditions but also to the fact that the soil had been in sod and/or soybeans for several years preceding 1976.

Red Pontiac led all other varieties by a wide margin with 559 cwt., while Neb 42-1 produced lowest yields with only 196 cwt. ND 8891-3 ranked second in yield with 426 cwt. and W 729R third with 418 cwt., followed by AK 25, 405 cwt.; Norchip, 397; La01-70, 390; and Minn 4536 with 378 cwt. per acre of U.S. No. 1 potatoes. All other varieties produced less than Katahdin which is the standard Ohio midseason cultivar. W 718 yielded below average in the NCR Trial in contrast to excellent yields on muck and in the STATEWIDE TRIAL. Most varieties yielding less than Katahdin were generally not promising.

Grade.--Tubers of ND8891-3 were smooth, elongate, light-colored and attractive but slightly small; 85% were graded U.S. No. 1. Red Pontiac produced the highest percentage U.S. No. 1 at 90% although tubers were generally rough and deep-eyed. The midseason standard Katahdin produced only 78% U.S. No. 1 potatoes due to a tendency toward both sungreening and off-shapes. All varieties yielding higher than Katahdin also produced higher grades except for Norchip. Neb 42-1 produced both lowest yields and poorest marketability with 196 cwt. and 65% U.S. No. 1 potatoes, respectively.

W 718 was subject to hollow heart with 19% of the tubers affected. Susceptibility to hollow heart was also characteristic of W 718 at other locations in Ohio in

1976. Hollow heart may seriously reduce the acceptance of W 718 in Ohio unless the disorder can be corrected by close spacing or other cultural methods. La 11-24 and Neb 42-1 each showed 7% hollow heart while 3% or less was found in all other varieties.

Several of the higheryielding varieties including ND 8891-3, W 729R, AK 25 and Norchip produced higher than average total solids. ND 8891-3, in particular, may be a promising chipping variety based on Ohio yield data and reports of excellent chipping potential from other states.

Ozone Damage.--Ozone damage was evident on several of the NCR varieties. Damage ratings ranged from 0.1, indicating no visibile injury, for Neb. 42-1, Ak 28 and Russet Burbank to 5.0, denoting severe injury and defoliation, for Norland. Norland is known to be susceptible to ozone injury. Earliness and ozone damage appeared to be related, in that early varieties were generally more susceptible. There were exceptions, however.

Observations. ND 8891-3 performed well at Wooster and other locations in Ohio, as well as in other North Central states in 1976. Based on these data, ND 8891-3 may have considerable potential as both a chipping and tablestock variety. ND 8891-3 appeared to be the most promising entry at Wooster in 1976 as indicated by a merit rating of 1. AK 25 was rated No. 2 because of good yields and appearance. Norchip was rated 3rd followed by La 01-70, W 726 and W 718. W 718 may have little potential due to hollow heart. Both W 729R and Minn 4536 appeared to be excellent red varieties but reds are typically not well received in Ohio.

TABLE 12. Average Yields, Grade, Maturity and General Characteristics of Entries, NORTH CENTRAL REGIONAL TRIAL, 1976.

Variety[4]	U.S. No. 1 cwt/A	U.S. No. 1 %	% B-size	% Hollow	Total Solids	Avg. Maturity[1]	Ozone Damage[2]	Gen. Merit[3]	Notes
Red Pontiac	559	90	2.2	0	15.4	4.0	2.6		Red. Deep Eyes. Rough.
ND 8891-3	426	85	3.4	2	18.4	3.0	0.2	1	Promising. Sm. White.
W 729R	418	86	2.9	1	18.6	3.8	0.2		Red. Deep eyes.
AK 25	405	80	3.6	0	18.6	3.8	1.1	2	Promising. Good Skin.
Norchip	397	78	2.7	0	18.4	2.5	3.0	3	Rough. Deep eyes.
La 01-70	390	84	2.7	3	18.2	3.2	2.6	4	Rgh. but promising.
Minn. 4536	378	83	2.0	0	16.9	2.2	3.1		Smooth, large red.
Katahdin	364	78	1.7	0	18.4	4.0	2.5		Typical.
Minn. 3866	353	83	5.6	1	17.3	2.5	3.6		Red. Mech. damage
W 726	352	82	2.9	2	17.7	3.8	1.5	5	Large, smooth.
Minn. 4858	343	84	3.6	0	16.5	2.0	3.4		Mech. damage.
W 718	335	81	2.8	19	16.5	3.0	2.1	6	Large, smooth. Feathering.
Norland	306	86	2.7	3	13.3	1.0	5.0		Thumbnail.
La 11-118	304	74	6.0	1	17.7	3.6	0.6		Sprouts early. Smooth.
R. Burbank	303	58	4.0	0	19.0	5.0	0.0		Rough!!
AK 28	288	80	3.8	2	17.5	3.8	0.0		Promising appearance.
La 11-24	259	78	2.5	7	16.9	3.2	2.6		Rgh. shape, good skin.
ND 8751-16	249	70	5.4	0	15.4	2.0	3.5		No promise. Small
ND 8913-4	205	74	13.1	2	17.5	2.0	4.7		Russ. No yield.
Neb. 42-1	196	65	7.7	7	18.4	4.7	0.0		Long russet. No yield.
Avg.	341	80	3.9	2.5	17.3	3.1	2.1		
LSD .05	86	0.6	1.6	---	----	---	---		

(1) 1-Very early, Norland; 2-Early, Cobbler; 3-Medium, Pontiac; 4-Late, Katahdin; 5-Very late, Kennebec.
(2) Top 7 varieties among all entries including check varieties.
(3) 0 - No visible damage; 5 - severe defoliation.
(4) Varieties ranked from highest to lowest yields.

STREETSBORO TRIAL

Procedure

Twenty-seven varieties and advanced selections were evaluated for total yield and susceptibility to ozone damage or "speckle leaf" on a commercial potato farm at Streetsboro. Plots were planted using a picker-type planter in gravelly loam on May 11. Individual plots were double rows 10 feet long and were replicated 4 times. The planting was located in a commercial field to insure the use of commercially acceptable cultural and pest control procedures. Ozone injury to the foliage was rated on August 2 and the plots were harvested on October 27.

Results

Yield.--Total yields averaged 344 cwt. per acre across all varieties (Table 13). ND 8891-3 led all others with 472 cwt. while NDA 8451-3 produced lowest yields with 198 cwt. Other entries yielding over 400 cwt. were: W 721, 455 cwt.; Kennebec, 454; MS 709, 422; W 731, 420 and Atlantic, 409 cwt. per acre. The standard midseason variety, Katahdin, produced 357 cwt. per acre.

Although Kennebec produced high total yields, off-shapes and tuber greening would have reduced U.S. No. 1 yields considerably. This is doubtless true of other varieties as well. MS 709 and Atlantic were also somewhat rough. In contrast, ND 8891-3 tubers were smooth and bright-colored. Average tubers of ND 8891-3 were somewhat oblong but smaller than average. W 731 tubers were also smooth and attractive. Both Atlantic and W 718 were susceptible to hollow heart.

Ozone Injury.--Varieties differed widely in susceptibility to "speckle leaf" or ozone injury. Average ozone ratings ranged from a low of 0.75, or almost no visible injury, for A 6789-7 to 4.75, or severe injury and premature defoliation, for Norland. Low yields seemed to be associated with severe ozone injury. There were several exceptions to this trend, however. A 6789-7, for example, produced lowest yields but also showed very minor speckle leaf. Low yields of A 6789-7 were due to a stand of only 50% and not to ozone injury. Establishing a relationship between ozone injury and yield is difficult, since earlier varieties in general tend to be more susceptible to ozone injury but also tend to product lower yields.

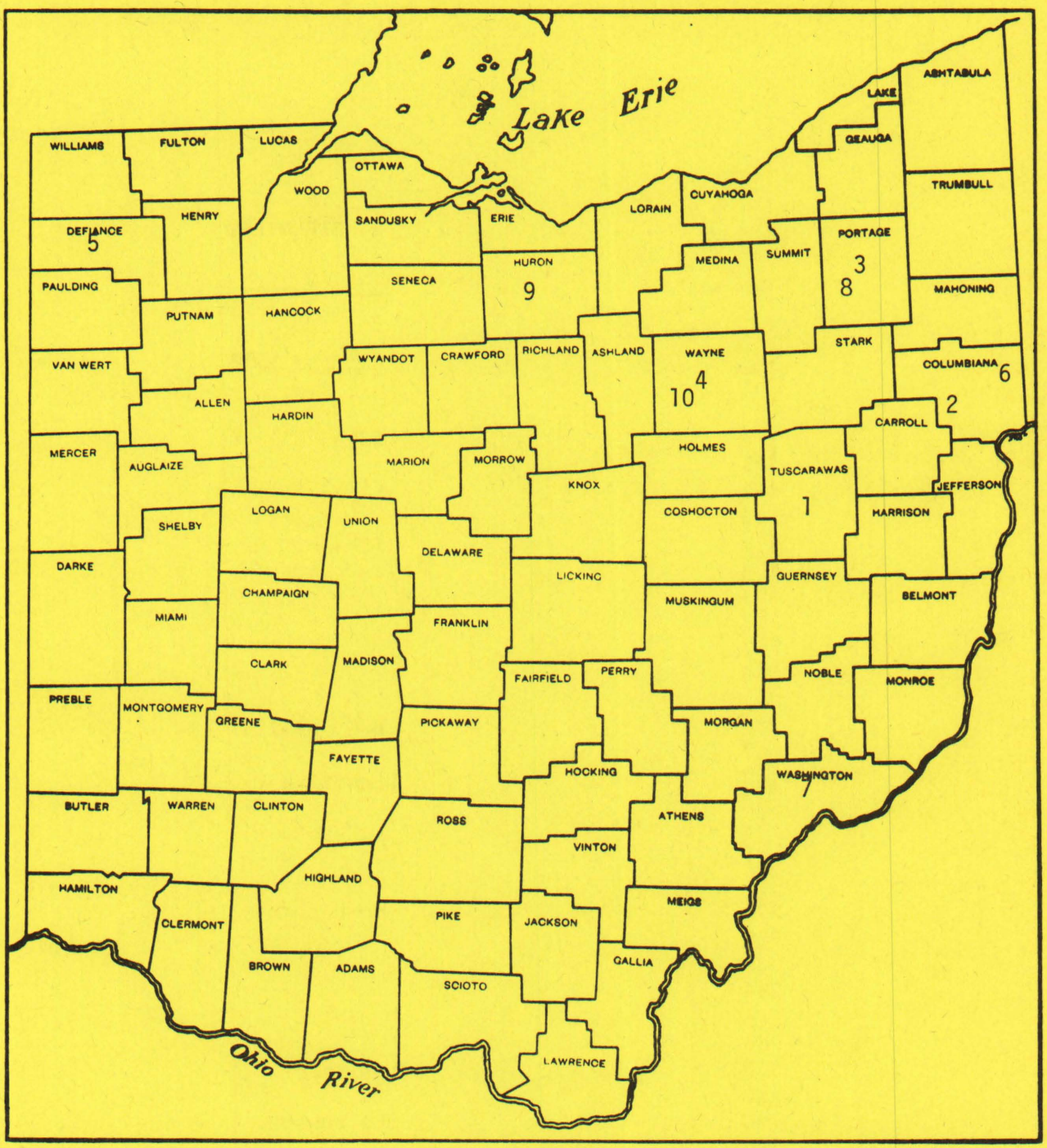
Observations.--The Streetsboro plots were small and tubers were not graded. Therefore, yield results should be considered only indicative and not conclusive. Ozone damage, however, is independent of plot size and speckle leaf ratings were reproducible in that varieties common to both the Wooster NCR trial and the Streetsboro Trial showed similar relative susceptibility at both locations. Norland, for example, was rated 4.75 at Streetsboro and 5.0 at Wooster; Katahdin rated 2.75 at Streetsboro and 2.5 at Wooster.

Several varieties appeared to be promising at Streetsboro. ND 8891-3 is chief among these; however, Atlantic, W 721, MS 709 and W 731 also yielded well and are worthy of further testing.

TABLE 13. Average Yields and Ozone Injury Ratings, STREETSBORO AIR POLLUTION STUDY, 1976.

Variety	Total yield, cwt/A	Ozone Damage (1)	Comments
ND 8891-3	472	1.50	Smooth, attractive round white
W 721	455	1.75	----------
Kennebec	454	1.87	Typical large, rough Kennebec.
MS 709	422	2.37	----------
W 731	420	3.00	Thick, netted skins, uniform shape.
Atlantic	409	2.87	----------
W 723	393	2.75	----------
W 726	392	2.87	----------
Shurchip	389	2.87	----------
W 718	386	3.13	----------
MS 711-8	381	2.25	----------
ND 8751-16	380	4.12	Round, small, rough tubers.
W 623	367	2.87	----------
Katahdin	357	2.75	Attractive
Superior	338	2.25	----------
WC 230-14	324	2.50	Large russet, second growth.
Hi-Plains	311	2.75	----------
Alma	300	1.87	----------
ND 8914-5R	298	3.50	Smooth russet. Similar Centennial.
Anoka	291	3.62	----------
Norchip	286	3.70	----------
Norland	284	4.75	----------
ND 8914-4R	274	4.25	Smooth, attractive russet. Small.
A 6789-7	268	0.75	----------
Wischip	250	4.00	Small, round tubers.
Centennial	212	4.13	----------
NDA 8451-3	198	3.00	Long russet. Deep eyes.
Average	344	2.32	
LSD .05	92	0.89	

(1) Ratings on August 27. 0 - No visible symptoms; 5 - severe damage with noticeable defoliation.



LOCATIONS OF 1976 OHIO POTATO VARIETY TRIALS

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